

Work Order ID 162951

Monday, June 19, 2017 9:00:36 AM

162951

Page 1

Item ID: D407-667-205TRN

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Turning Detail

Start Date: 6/19/2017 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 6/30/2017 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: W Date: _____ Tooling: _____ Date: _____Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D407-667-245	Rev G

100

0.78

100

Mori Seiki

Mori Seiki CNC Lathe Large

MORI SEIKI CNC LATHE LARGE

Memo

2.64

1- Fill tube with sand & install plugs 407-205 on both ends as per Folio FA248

2- Face both side of tube

3- Turn first taper section on both side as per folio FA248

4- Blend transition lines only with belt sander 60 grit **Do not sand whole tube**

FOLIO REV: AA
DWG REV: 61 Ø DAS 23 9-89

17/6/24

110

QC2- Inspect parts off machine FAI/FAIB

0.00

110

QC

Quality Control

Memo

0.00

1 Ø DAS 23 9-89 DAS 23 9-89

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Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
120	MORI SEIKI CNC LATHE LARGE					<u>1</u>	<u>Ø</u>		DAS 23 9-89
Mori Seiki	Memo	2.56							
Mori Seiki CNC Lathe Large	1- Turn second taper on both side								
	2- Blend transition lines only with belte sander 60 grit, **Do not sand whole tube**: **Do not use sandpaper coarser than 320 grit.								
	FOLIO REV: <u>AA</u> DWG REV: <u>G</u>								
	3- Remove sand and plugs								
	4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D407-667-245								
130									
130	QC2- Inspect parts off machine FAI/FAIB	0.00				<u>1</u>	<u>Ø</u>		DAS 23 9-89
QC	Memo	0.00							
Quality Control	Ultra sound the crosstube as per FAI. "wall thickness mesurment" at given location.								

17/6/16

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Page 3

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N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Crosstube Turning Detail

Start Date: 6/19/2017 Start Qty: 1.00

1

Cust Item ID:

Required Date: 6/30/2017 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

NR1

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140	QC8- Inspect parts - second check	0.00				1	0		Stamp 47 7-89
140									
QC	Memo	0.02							
Quality Control								17-06-26	
145		0.06				GP	17	06	27
145									
Crosstubes	Memo	0.54							
Crosstubes	Grind off circumferential machining marks longitudinally.					DP			
150		0.00				GP	17	06	29
150									
HandFXtube	Memo	1.27							
Hand Finishing Crosstubes	1- PRESSURE WASH X-TUBE INSIDE AND OUT					DP			
	2- ALODINE AND ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE								

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Page 4

Item ID: D407-667-205TRN

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Revision ID:

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Start Date: 6/19/2017 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 6/30/2017 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160	QC7-Inspect Chemical Conversion Coat	0.00				DAS 37 9-89	17	-07-03	
160									
QC	Memo	0.01							
Quality Control									
170		0.00							
170	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and stock in kanban rackLocation: 1614								
180	QC21- Final Inspection - Work Order Release	0.00							
180									
QC	Memo	0.10							
Quality Control									

DAS
21
9-89 JUL 03 2017

Picklist Print

Monday, June 19, 2017 9:00:35 AM

Work Order ID: 162951

162951

Parent Item: D407-667-205TRN

D407-667-205TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 6/19/2017

Required Date: 6/30/2017

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 Removed polish EC verified by: DD
IPP Rev:C 08-08-19 revE as per dwg DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D6011-115		Manufactured	No			120	Each	60.0000	1	1			
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D6011-115

**

Crosstube Material

Location	Loc Qty	Loc Code
BACK HALL	19	
139419	19	
LG003	41	
107880	13	
123976	19	
144447	9	

DAS
23
9-89

7/6/21

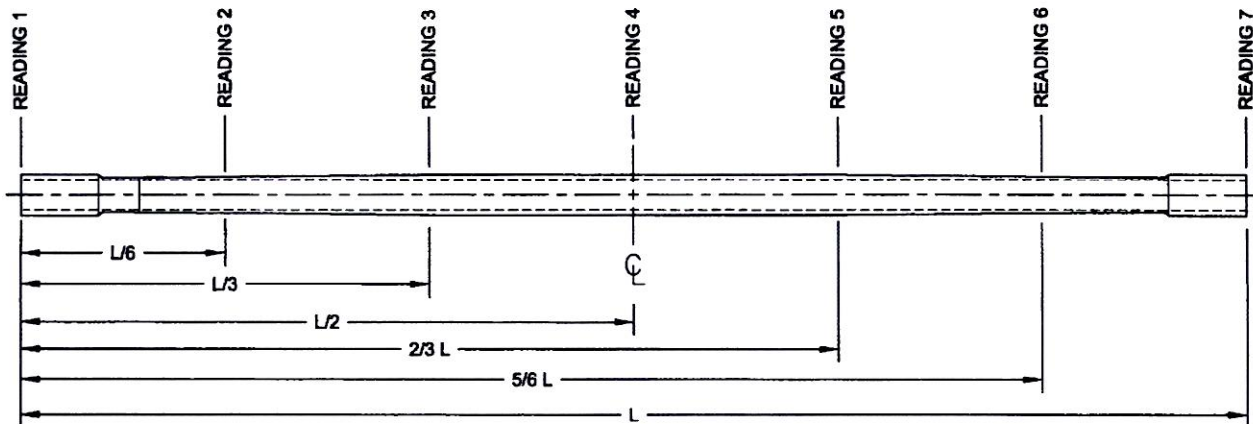
DART AEROSPACE LTD		Work Order: 162951
Description: Crosstube Assembly		Part Number: D407-667-245
Inspection Dwg: D407-667-245 Rev: G		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.493	✓		↑ Vernier tape ↓ Vernier ↓ RG Vernier	
	1.832	+0.005/-0.000	1.835	✓			
	1.838	+0.005/-0.000	1.843	✓			
	1.892	+0.005/-0.000	1.897	✓			
	2.052	+0.005/-0.000	2.054	✓			
	2.206	+0.005/-0.000	2.211	✓			
	2.521	+0.005/-0.000	2.524	✓			
	2.633	+0.005/-0.000	2.6345	✓			
	4.10	+/-0.030	4.10	✓			
	4.978	+/-0.030	4.978	✓			
	2.040	+0.000/-0.010	2.032	✓			
	0.125	+/-0.010	0.125	✓			
	R0.063	+/-0.010	R0.063	✓			
	R0.500	+/-0.010	R0.500	✓			
SIDE B	2.490	+0.005/-0.000	2.493	✓			
	1.832	+0.005/-0.000	1.836	✓			
	1.838	+0.005/-0.000	1.843	✓			
	1.892	+0.005/-0.000	1.897	✓			
	2.052	+0.005/-0.000	2.054	✓			
	2.206	+0.005/-0.000	2.211	✓			
	2.521	+0.005/-0.000	2.524	✓			
	2.633	+0.005/-0.000	2.6345	✓			
	4.10	+/-0.030	4.10	✓			
	4.978	+/-0.030	4.978	✓			
	2.040	+0.000/-0.010	2.031	✓			
	0.125	+/-0.010	0.125	✓			
	R0.063	+/-0.010	R0.063	✓			
	R0.500	+/-0.010	R0.500	✓			
	112.91	+/-0.020	112.91				

DART AEROSPACE LTD	Work Order: 162951
Description: Crosstube Assembly	Part Number: D407-667-245
Inspection Dwg: D407-667-245 Rev: G	Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	235	242	239	236	0.007	0.075"
READING 2 L= 18.82	249	274	245	217	0.057	
READING 3 L= 37.64	418	424	415	402	0.022	
READING 4 L= 56.46	655	656	645	658	0.013	
READING 5 L= 75.28	418	413	410	415	0.008	
READING 6 L= 94.10	242	246	249	248	0.007	
READING 7 L= 112.91	236	236	238	238	0.002	

Calibration Result

Actual Block Thickness: 200-750

Sitescan 250 Measured Thickness: 200-750

Measured by: DAS 23 9-89	Audited by: DAS 47 9-89	Preliminary Approval:
Date: 17/6/21	Date: 17-06-26	Date:

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-205)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	06.03.30	Tolerance revised for 4.978 dimension	KJ/JLM	
D	07.02.19	Dwg Rev updated	KJ/JLM	
E	09.05.20	Dwg Rev updated	KJ	
F	12.06.04	Wall thickness form added	KJ	
G	15.05.14	Dwg Rev updated	KJ	

Item	QTY	PART NUMBER	DESCRIPTION
	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	1	D6011-115	CROSSTUBE
2	2	D2873-043	NUT PLATE
3	2	D2873-045	NUT PLATE
4	1	D2894-1	SUPPORT
5	2	D3190-1	CHAFING SHIELD
6	2	D3595-063-430	RUBBER CUSHION
7	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
8	4	MS21920-22	CLAMP
9	2	MS21920-25	CLAMP (OR MS21920-24)
10	AR	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
11	AR	PROSEAL 890	SEALANT

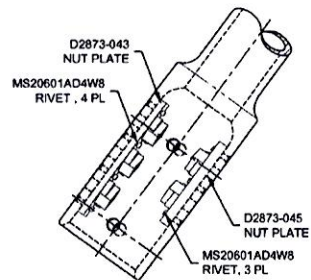
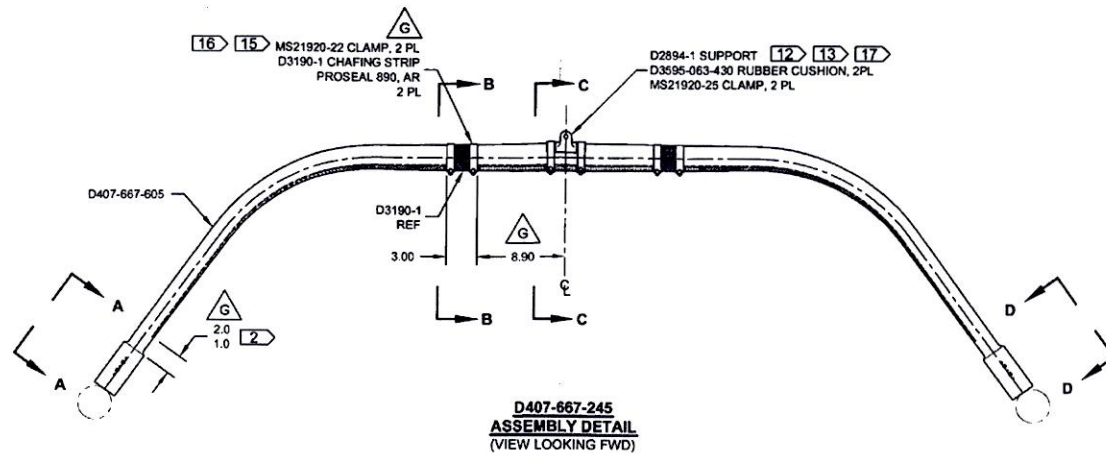
GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT CROSSTUBE PER DART QSI 005 4.2
FOR HATCHED AREAS (ZN A6-2), MASK AS REQUIRED
TO APPLY PRIME AND APPLY CLEAR COAT ONLY
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1 CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS 50 TO 70 DEGREES FROM BOTTOM OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. TORQUE CLAMPS ON D3190-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

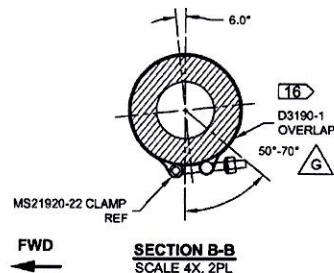
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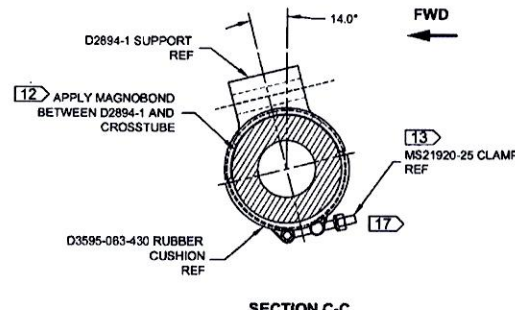
G	INCORP. DEO's D407-667-245-F1/F2 (ZN D8-1, A6-1, D5-2, B6-2, C6-2); 8.90 WAS 8.53 (ZN D5-2); TORQUE REDUCED FOR CHAFING SHIELD (ZN A6-1); FINISH REVISED TO ALLOW MANUFAC. FLEXIBILITY (ZN C6-1)	RF	15.03.20
F	REFORMAT NOTES TO NEW STANDARDS (ZN B6-1); RELOCATED FLAG # 6 (ZN A6-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECU#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNABOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	P		
DRAWN	RF		
CHECKED	P		
MFG. APPR.	P		
APPROVED	P		
DE APPR.	P		
DATE	15.03.20		
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D407-667-245 SHEET 1 OF 4 TITLE CROSSTUBE ASS'Y (407 HIGH AFT) SCALE NTS COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD			



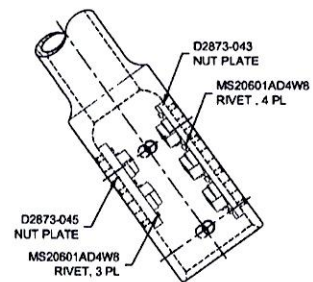
VIEW A-A CUFF DETAIL
SCALE 4X



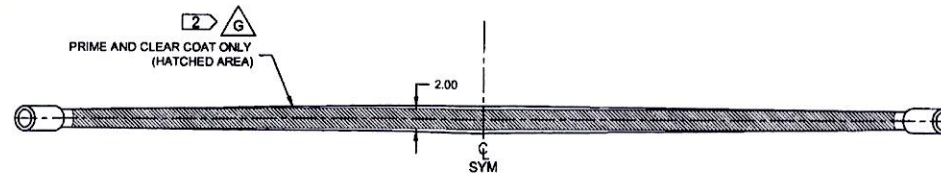
SECTION B-B
SCALE 4X, 2PL



SECTION C-C
SCALE 4X



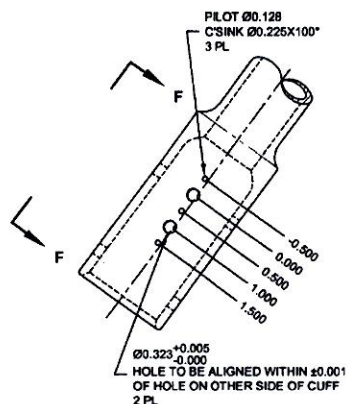
VIEW D-D CUFF DETAIL
SCALE 4X



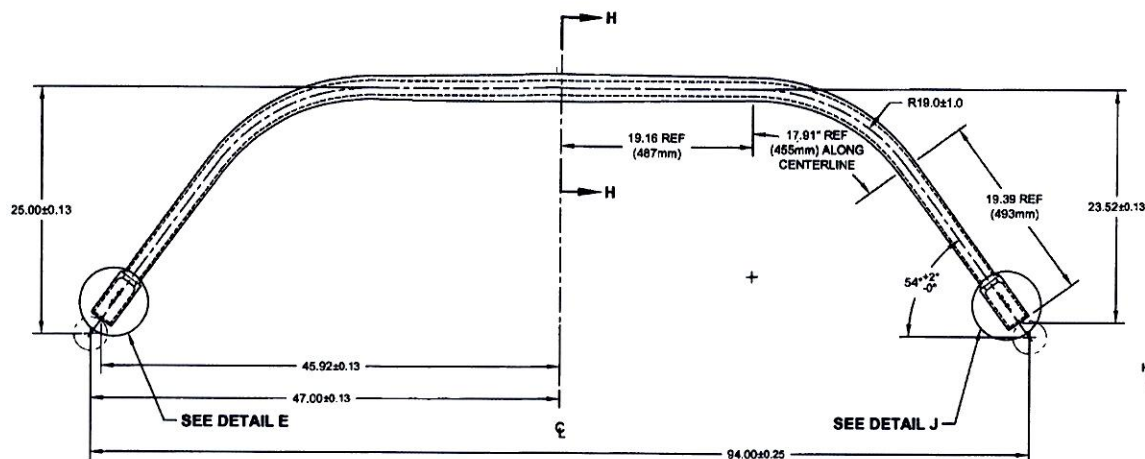
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2015 APR 09

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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	QF	DRAWING NO.	REV. G
MFG. APPR.	QF	D407-667-245	SHEET 2 OF 4
APPROVED	QF	TITLE	SCALE
DE APPR.	QF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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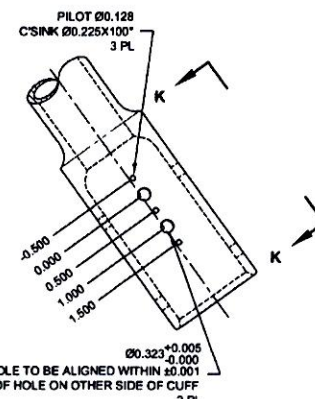
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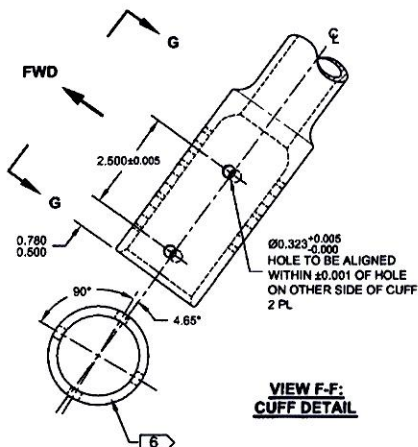
DETAIL E
SCALE 4X
(VIEW LOOKING FWD)



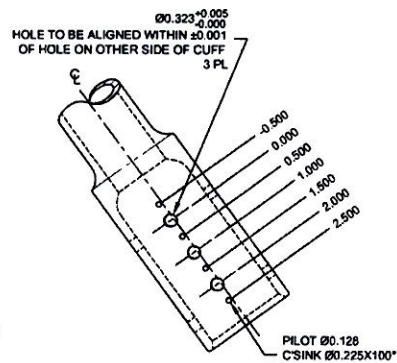
D407-667-605
BENDING AND DRILLING DETAIL
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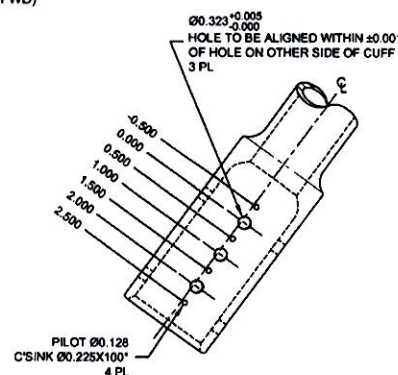
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(VIEW LOOKING FWD)



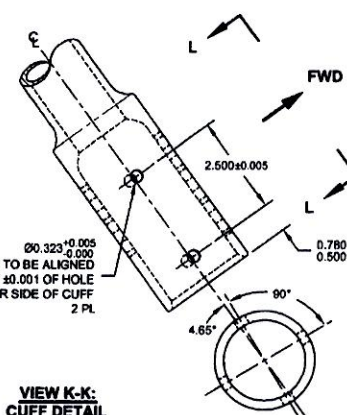
VIEW F-F:
CUFF DETAIL



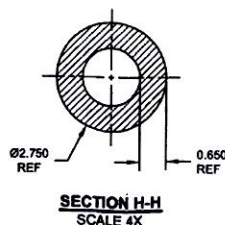
VIEW G-G
(VIEW LOOKING AFT, ROTATED)



VIEW L-L
(VIEW LOOKING AFT, ROTATED)



VIEW K-K:
CUFF DETAIL



SECTION H-H
SCALE 4X

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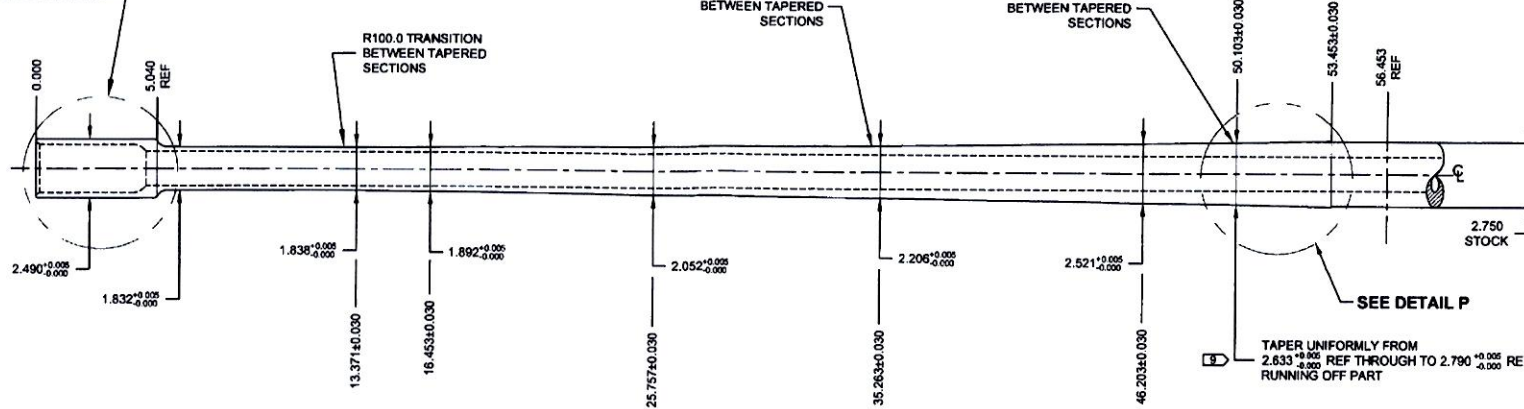
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APPROVED	RF
DE APPR.	RF
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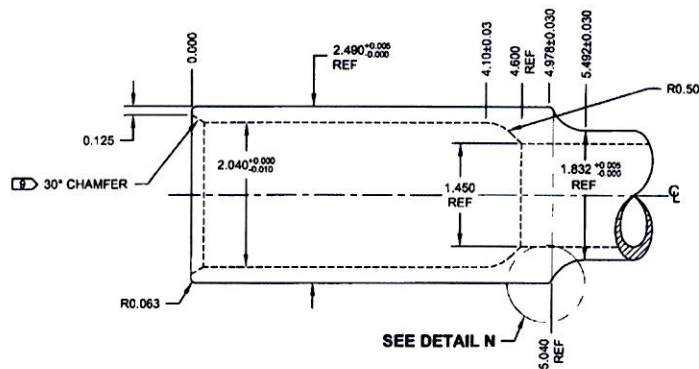
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
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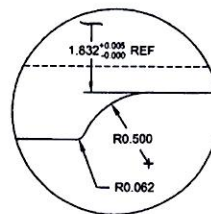
SEE DETAIL M



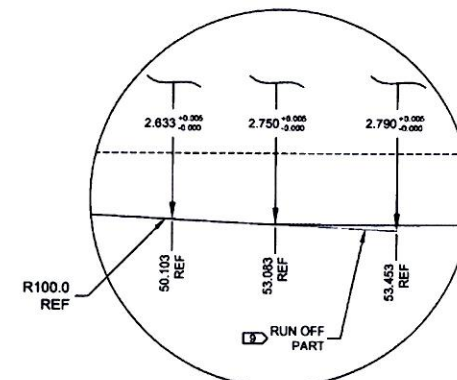
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED
2015 APR 09

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO. D407-667-245	REV. G
MFG. APPR.	RF		SHEET 4 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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